Anterior abdominal wall reconstruction with *fascia lata*

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Summary

Anterior abdominal wall is a complex fascio-muscular structure, defects of which may arise as a result of infection, trauma, malignancy and herniation. Different techniques have been devised to repair these defects with varying result, availability and cost implications.

In the communication, the use of fascia lata for repair of major anterior abdominal wall defect in five patients is reported. The result suggests that this is a useful technique that is associated with satisfactory outcome and minimal morbidity.

Key words: ***Fascia lata, Anterior abdominal wall, Defects, Repair.***

Résumé

L'antérieur de la paroi abdominale est une structure fascio-musculaire compliquée, sa rupture peut être à cause de l'infection, trauma, la malignité et l'hernie. Des méthodes diverses avaient été adoptées pour soigner ces ruptures tout en indiquant des résultats diverses disponibles et à grand frais. A travers cette étude, nous tenons à donner le compte rendu de la methode du fascia lata pour le traitement de la rupture majeure dans l'antérieur de la paroi abdominale chez cinq patients. Le résultat évoque la question relative au fait que cette méthode est trés efficace et assure un succès et la morbidité minimale.

Introduction

The anterior abdominal wall is a complex fascia-muscular structure consisting of a pair of three overlapping laterally placed muscles and a central one, lying over the *transversalis fascia*[1]. It maintains the integrity of the abdominal cavity, protects the bowels, and is an accessory muscle of respiration.

Conditions that lead to its loss are rare, but when they occur, constructing a replacement can be a surgical challenge. The commonest of such conditions is ventral hernia, which result in loss or attenuation of some of its components. Other conditions such as infections, radiation and chemical injury, tumors, and trauma can also lead to loss of the anterior abdominal wall.

This loss is usually repaired by direct closure where possible or by using artificial meshes and implants. However, in certain cases such as hernias with a wide defect, extensive diseases and where there is associated skin or peritoneal defect these techniques may not suffice or be applicable. In developing countries where extensive defects are commonly seen due to neglect or advanced disease, the non-availability and expense of implants add to the difficulty of managing these conditions. The use of *Fascia lata* graft has been studied in five such patients, and the outcome is reported in this communication.

Patients and method

All patients with potential requirement for anterior abdominal wall reconstruction seen between January 1993 and December 1997 were recruited into the study. There were nineteen cases, seven of whom met the criterion for the study which was envisaged difficulty or inability to perform direct closure of the anterior abdominal wall during surgery because of wideness of defect. The seven patients were counseled and the various options available were discussed with them. The indications for surgery were[1] anterior abdominal wall soft tissue sarcoma in three cases, and[2] recurrent incisional hernia in four cases. One patient with incisional hernia had direct closure after definition of the defect at surgery, while another, also with incisional hernia obtained Marlex mesh from abroad and had this inserted. The remaining five patients formed the subject of this study. They had bowel preparation so as to reduce the size of the abdominal contents and allow primary colonic closure in case of iatrogenic injury. The operation entailed the removal of the primary lesion followed by a reevaluation of the size of the defect and the need for reconstruction.

If patients were deemed to require reconstruction, the *Fascia lata* was exposed through a gentle "S" shaped vertical incision on the lateral aspect of the thigh and a length of it was dissected, depending on the size of the defect. Occasionally, it was necessary to dissect the fascia in both thighs if the defect was large. The fascia was attached to the edge of the defect using continous 4 or 5 "0" non-absorbable suture (e.g. prolene) on a round-bodied needle. The skin was closed over the graft where possible, and where this was not possible, other methods of

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achieving skin coverage were employed. Patients were gently ambulated 4 days after surgery. Physiotherapy to prevent deep vein thrombosis and return power to the thigh muscles was commenced on the first postoperative day.

Result

All five patients were females and their ages ranged from 33 to 71 years with a mean of 43 years. One patient

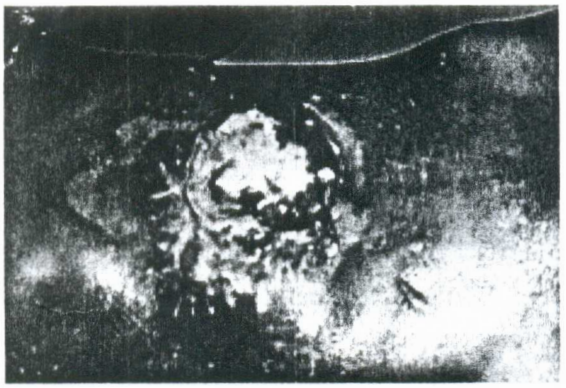

Fig. 1 *Patient with recurrent anterior abdominal wall soft tissue sarcoma associated with extensive skin loss.*

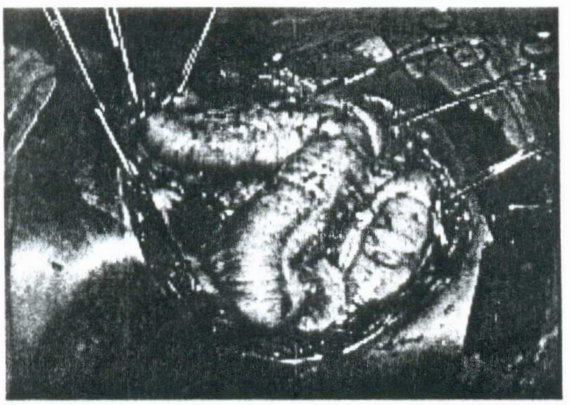

Fig. 2 *The defect after complete resection of tumour.*

had recurrent, ulcerated soft tissue sarcoma of the anterior abdominal wall with extensive skin loss (figure 1). As the split thickness skin graft will not survive on bare fascia, a pedicled omental flap was raised and laid on the *Fascia lata* graft. The split thickness skin graft was then placed on this. Another patient required dissection of the *Fascia lata* of both thighs to cover the defect of a large recurrent incisional hernia. Yet another patient, a physician with recurrent desmoid tumour of the anterior abdominal wall also had bilateral *Fascia lata* graft.

Mean blood loss from the graft harvest was 385 ml and the process added an average of $1^1/_2$ hours to the

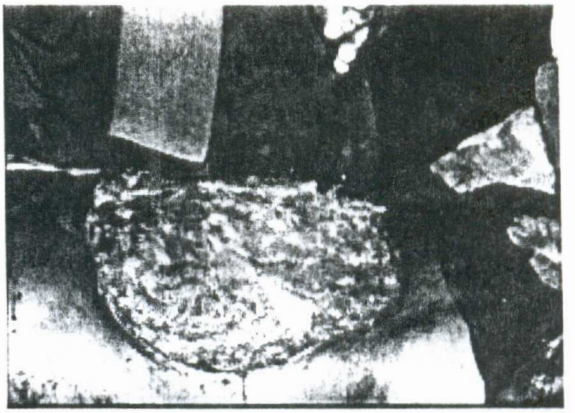

Fig. 3 *The anterior abdominal wall after Fascia lata covered by pedicled omental flap and split thickness skin graft has been inserted.*

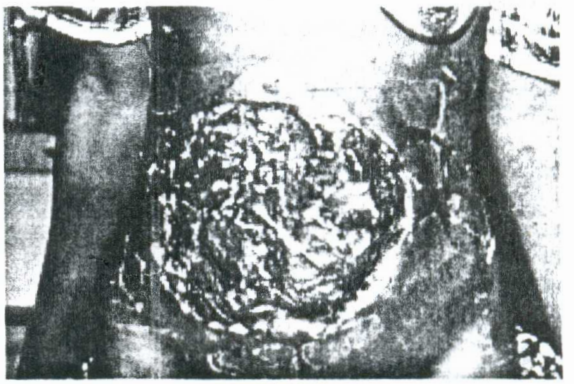

Fig. 4 *Patient seen 21 days post-operation.*

operating time. The wound healed primarily in all the patients and median post-operative stay in hospital was ten days. The patients reported a loss of power from normal to $^3/_5$ in the thigh post-operation and this was most noticeable during the climbing of stairs. It however recovered after a mean of 4 months of physiotherapy. The patients have been followed up for a median of 3 years and no complication attributable to the procedure has been reported.

Discussion

Anterior abdominal wall reconstruction arises in situations where has been extensive loss of tissue because of disease or after operation. In most cases, primary closure of the anterior abdominal wall is possible, however, where the defect is wide, attempts at primary direct closure may lead to splintage of the diaphragm, impaired mesenteric and inferior vena caval flow, and gangrene of the bowel.

Different techniques have been devised to overcome

this problem including the use of pneumo-peritoneum to increase the size of the abdominal cavity pre-operativel. This is applicable in patients with disease like hernias but is often not successful[2,3]. It is also of limited application in patients with sudden loss of the anterior abdominal wall due to trauma or operation, and in anterior abdominal wall malignancies. Primary closure with post-operative ventilatory support and muscle paralysis has been successfully used in adults and children[2,4] but it is expensive and fraught with danger. Where the defect is small, various types of vascularized grafts based on the thigh muscles can be used.

A variety of synthetic materials are available for anterior abdominal wall replacement especially where the defect is too wide for pedicled flaps[5]. These include matrials made from Nylon, Teflon, Prolene, and Marlex. However these materials are often not available or may be too expensive for many patients in this environment. Their use is also limited in the presence of infection or extensive skin and peritoneal loss. Free myocutaneous flaps can also be used but these require equipment for, and expertise in small vessel anastomosis.

Autogenous tissues have been used in the repair of hernias for a long time[6]. These have include dermal grafts, fascial sutures and *Fascia lata* grafts. The introduction of prosthetic materials however diminished their popularity[7]. Where these prothetic materials are not available, too expensive or considered inappropriate as a result of the presence of infection, extensive peritoneal or skin loss, the use of Fascia lata grafts can be considered. The graft, which has minimal metabolic requirements, that is met by diffusion of nutrients from the peritoneal fluid has the strength to maintain anterior abdominal wall integrity and prevent herniation. Where there is need to add a split thickness skin graft to repair skin loss, an omental flap can be mobilized and placed on the graft over which the skin is now laid as was done in the patient presented in Figure 1 to 4. These results suggest that this is a useful technique that is associated with satisfactory outcome and minimal morbidity. While no complications were found in this series of patients, possible complications include recurrence of hernia, deep vein thrombosis, adhesive intestinal obstruction, and recurrence of the primary disease. Use of appropriate sutures, prophylactic anti-coagulation, and physiotherapy will reduce their incidence. In conclusion Fascia lata graft is a viable option for the reconstruction of anterior abdominal wall defect in this environment.

References

1. Last R J. Anatomy: Regional and Applied. Edinburgh, Longman 1984. 212.
2. Atimomo C E. Management of giant umblical hernia in an adult Nigerian. Nig. Med. Pract. 1996. 31: 91 – 93.
3. Rayner R W, Louis R M, Delguercio J. Update on the use of pre-operative pneumoperitoneum prior to the repair of large hernia of the abdominal wall. Surg. Gynecol. Obstet. 1985. 161: 367 – 371.
4. Canty TG, Collins DL. Primary fascial closure in infants with gastroschisis and omphalocoeles: A superior approach J. Paed. Surg. 1983. 18: 707 – 712.
5. Vasconez L O, Jae-Wook O. () Flaps and other reconstructive techniques. In Nyhus L M, Baker J R, Fischer J E. (Ed) Mastery of Surgery. Boston: Little, Brown and Company 1997. 274 – 288.
6. Nyhus LM, Condon R.E. (Eds.) Hernia. Philadelphia, J. B. Lippincott. 1978.
7. Usher F C. The repair of incisional and inguinal hernia. Surg. Gynecol. Obstet. 1970. 131: 525 – 539.